IN THE DRAWINGS:

Filed concurrently herewith is Letter to the Official Draftsperson submitting sixteen (16) sheets of FORMAL drawings for Figures 1-16, including the corrections approved by the Examiner for Figure 2.

REMARKS

The following remarks and information are for entry and consideration in the above-identified application.

OBJECTION TO THE INFORMATION DISCLOSURE STATEMENT-TRAVERSED

Submitted concurrently with the present application was a Form PTO-1449 and a copy of the article discussed in the originally-filed specification at page 2, lines 1-5. At Item 1 on page 2 of the Detailed Action, the Examiner indicates that the article was not considered because "a translation has not been provided." Attached to the 12 September 2002 Office Action is a copy of the Form PTO-1449 submitted with the application, showing the article struck-through as not being entered or considered.

Applicant respectfully draws the Examiner's attention to 37 CFR §1.98(a)(3)(i), which states that a statement of relevance for a foreign reference may be made either separately or <u>in the specification itself</u>, as in the "BACKGROUND OF THE INVENTION" section in the present case. Therefore, all requirements under §§1.97 and 1.98 were met, and <u>no translation of the article is properly required</u>.

Applicant again attaches a copy of the Form PTO-1449 listing the article, and requests that the Examiner initial and return the Form to indicate that it has been made of record and considered in the present application.

OBJECTION TO THE DRAWINGS-CORRECTED DRAWINGS FILED

At Item 2 on page 2 of the Office Action, the drawings are objected to because a copy of the figures with English language translations has not been filed. Submitted concurrently herewith is a Letter to the Official Draftsperson and sixteen (16) sheets of formal drawings for Figures 1-16, including Figure 2 corrected as shown in the proposed amendment thereto filed 9 June 2000 and approved by the Examiner.

Applicant respectfully requests reconsideration and withdrawal of the objection to the drawings.

OBJECTION TO THE ABSTRACT-ABSTRACT AMENDED

The Abstract Of The Disclosure was objected to because of the Office Action concerns listed at Item 4 on page 3 of the Office Action. As the attached replacement Abstract has been corrected as required in the Office Action, reconsideration and withdrawal of the objection to the Abstract are respectfully requested.

OBJECTION TO THE SPECIFICATION-SPECIFICATION AMENDED

The specification was objected to because of the Office Action concerns listed at Item 5 on page 3 of the Office Action. As the disclosure/specification has

been carefully reviewed and has been amended where appropriate in order to address each of the Office Action listed concerns, reconsideration and withdrawal of the objection to the disclosure/specification are respectfully requested.

Any spelling, idiomatic, grammatical and/or other informality noted during further review of the disclosure/specification will be corrected.

35 USC §112, 2nd PARAGRAPH OBJECTIONS-MOOT VIA AMENDMENT

Claims 1-3 were objected to under 35 USC §112, second paragraph, for the informalities noted at Item 7 on page 4 of the Office Action. The claims have been amended to overcome the objections, and therefore, reconsideration and withdrawal of the objections to Claims 1-3 under §112, second paragraph, are respectfully requested.

PENDING CLAIMS

Claims 1-3 were pending in the application at the time of the Office Action, under consideration and subject to examination in the Office Action. Unrelated to any prior art rejection, appropriate claims have been amended or added in order to adjust a clarity and/or focus of Applicant's claimed invention. For example, Claims 1-3 have been amended, and new Claims 4-11 are submitted herein, to adjust a clarify of Applicant's claimed invention. The amendments to the claims are unrelated to any prior art or scope adjustment, and are simply clarified claims in which Applicant is presently interested. At entry of this paper, Claims 1-11 are pending for further consideration and examination in the application.

REJECTIONS UNDER 35 USC §103

All 35 USC §103 rejections (*i.e.*, the 35 USC §103 rejection of Claims 1 and 2 as being unpatentable over Aloni *et al.* (USP 6,360,005) in view of Ueda (USP 5,586,239), and the 35 USC §103 rejection of Claim 3 as being unpatentable over Aloni *et al.* in view of Ueda, and further in view of Nara *et al.* (USP 6,421,122)) are respectfully traversed based upon the following.

All descriptions of Applicant's disclosed and claimed invention, and all descriptions and rebuttal arguments regarding the applied prior art, as previously submitted by Applicant in any form, are repeated and incorporated herein by reference. Further, all Office Action statements regarding the prior art rejections are respectfully traversed. As additional arguments, Applicant respectfully submits the following.

Applicant's disclosed and claimed invention is directed to inspecting arrangements which allow easy visual classification of semiconductor manufacturing defects by a user viewing a display screen. The display screen has an unsorted area in which images of unclassified defects are contained, and further has a number of classification areas into which the unclassified defects can be manually moved by the user. For example, a defect which is mainly white in color may be pointed to, selected, and drag-and-dropped into a "mainly white" classification area, by a user viewing the display screen and using a mouse. Similarly, a defect which is mainly black in color may be pointed to, selected, and drag-and-dropped into a "mainly black" classification area. Since visual imagery is used in user-designating of the visual defects to the visual defect classifications (as opposed to user

13

keyboarding of data classification), Applicant's arrangements are quick, easy and accurate.

In terms of claim language, independent Claim 1, for example, (in part) claims an inspecting system including a display means having a screen with a first area for displaying a plurality of said detected images stored in said storage means and a plurality of second areas for classifying said detected images according to features of said detected images; and <u>means for moving said plurality of detected images on said screen from said first area to selected second areas to classify said detected images</u> in said second areas. Claims 2 and 3 contain analogous limitations.

New independent apparatus Claim 4 (and similarly, method Claim 8) claims an inspecting system including a display with a <u>sorting display area</u> in which to display ones of the images with unclassified semiconductor manufacturing defects, and a plurality of <u>defect-classification display areas</u> into which each image of the images may be classified according to visual manufacturing defect features contained in the image; and <u>a user-manipulated moving unit to move a subject image from the sorting display area to a selected one of the defect-classification display areas, to classify the subject image into the selected one of the defect-classification display areas</u>.

New dependent Claim 5 (and similarly, method Claim 9) further clarifies that the user-manipulated moving unit includes a user-manipulated pointing device to point to, select and drag-and-drop the subject image from the sorting display area into the selected one of the defect-classification display areas, while dependent Claim 6 (and similarly, method Claim 10) states that the user-manipulated pointing device is a mouse.

14

Finally, dependent Claim 7 (and similarly, method Claim 11) further includes a memory to store predetermined information for at least ones of the images including defect-classification information, and an adjuster unit to adjust the defect-classification information for the subject image to match a defect classification of the selected one of the defect-classification display areas to which the subject image is moved.

Turning now to rebuttal of the applied art, Aloni *et al.* likewise relates to a defect detection system. As admitted on page 5 (lines 6+), "Aloni does not disclose a screen with a first area for displaying a plurality of detected images stored in the memory nor a plurality of second areas for classifying the detected images according to their features", and also, "Aloni does not disclose classifying the images by moving them from the first area to selected second areas."

Ueda, as a secondary reference, relates to a computer controlled graphics display system for supporting image classification. However, it is respectfully submitted that Ueda appears directed to unrelated art in that Ueda seems to be classifying "data units" such as hypertext, as opposed to manufacturing defects.

Even assuming *arguendo* that Ueda is relevant art, it is well settled in U.S. patent law that the references themselves must suggest combination in such a manner so as to arrive at Applicant's disclosed and claimed invention. First, it is respectfully submitted that Aloni *et al.*/Ueda would not suggest combination, as Aloni *et al.* relates to defect detection in manufacturing, whereas Ueda relates to classifying computer graphics objects such as hypertext. Second, combination would not result in Applicant's invention, and in fact, would strongly suggest non-combination.

15

More particularly, a whole gist of Applicant's and Aloni *et al.*'s disclosure is to detect and/or classify manufacturing defects. Images of such defects are displayed on a display screen, and it is very important that the defect images remain in unadulterated form. Ueda's classification arrangement assigns a "symbol mark" to each graphics object, which then overlaps the graphics object. More specifically, Ueda's FIG. 3a shows the original objects, whereas Ueda's FIG. 3b shows "cloud" and "starred" symbol marks added to surround/classify the objects. To suddenly combine Aloni *et al.*/Ueda and add symbol marks to surround Aloni *et al.*'s manufacturing defects would visually alter/adulterate the defect images and most certainly lead to misclassifications.

Accordingly, as a result of the foregoing, it is respectfully submitted that the Office Action attempt to combine Aloni *et al.*/Ueda is nothing more than an improper hindsight attempt to reconstruct Applicant's invention using unrelated parts/ideas from unrelated disclosures. In short, neither of the Aloni *et al.* or Ueda references (alone or in combination) suggests Applicant's screen with a first area for displaying a plurality of detected images stored in the memory nor a plurality of second areas for classifying the detected manufacturing defect images according to their features, or moving them from the first area to selected second areas.

Turning finally to the third cited reference, Nara *et al.* appears to have been cited for disclosing an arrangement for a method of manufacturing. However, it is respectfully submitted that Nara *et al.* does not cure the deficiencies mentioned above with respect to the primary and secondary Aloni *et al.*/Ueda references. Accordingly, it is respectfully submitted that no Aloni *et al.*/Ueda/Nara combination could have resulted in or suggested Applicant's disclosed and claimed invention.

16

In addition to the foregoing, the following additional remarks from Applicant's foreign representative are also submitted in support of traversal of the rejection and patentability of Applicant's claims.

Some of the novel features of the claimed invention is that an analyzing unit includes (a) display means which displays a first area and a second area on the same screen, (b) "drag-and-drop" means by which a user can move an object from the first area to the second area on the screen merely using a mouse or other pointer device, and (c) display means which displays the defect image in the first area.

Each of defect images has visible features, such as size, color, shape and the like. A user can classify defective images by looking at the visible features of the images in the first or second area, and can move them from the first or second area. Therefore, the user can reduce the failure of the classification.

Compared with the present invention, Aloni *et al.* does not disclose the claimed feature (b) as noted above. The reference to Ueda discloses a classification method, but Ueda's concept is to classify (disorderly) image by moving (attaching) the (classified) image to it. Therefore, according to Ueda, moving the object (information) to another display area cannot be performed after classifying the (disorderly) information. According to our invention, classifying the (disorderly) object is performed by moving it to a different display area. Moreover, according to Ueda, the (disorderly) information does not have the visible features, the (classified) image has them. Therefore, according to Ueda, classifying an image cannot be performed after attaching it, and the classifying cannot be performed merely by moving the object (the disorderly information) to a different area. That is, Ueda does

17

not disclose the claimed feature (b), so neither Aloni *et al.* nor Ueda disclose the claimed invention, either alone or in any possible combination.

Nara *et al.* also doesn't disclose the claimed feature (b).

As a result of all of the foregoing, it is respectfully submitted that the applied art (taken alone and in the Office Action combinations) would not support a §103 obviousness-type rejection of Applicant's claims. Accordingly, reconsideration and withdrawal of such §103 rejection, and express written allowance of all of the §103 rejected claims, are respectfully requested. Further, at this point, it is respectfully submitted as a reminder that, if new art is now cited against any of Applicant's substantially unamended claims, then it would not be proper to make a next Action final.

REFERENCE ANTEDATEABLE

Applicant respectfully notes that an effective filing date (29 November 1999) of the Nara *et al.* reference falls between the present application's U.S. filing date (01 December 1999) and the present application's foreign priority date (01 December 1998), and accordingly, such reference can be removed as valid prior art by the filing of an English language translation of Applicant's foreign priority document(s) together with a statement that the translation of the certified copy is accurate. Applicant respectfully reserves the right to file such certified English translation in order to remove such reference as valid prior art. The Examiner is invited to telephone the undersigned at the local Washington, D.C. area telephone 703-312-6600, to request such certified copy in the event that filing of the same would move the application to allowance.

Based upon the foregoing, reconsideration and withdrawal of such rejections are respectfully requested. The above statements, and/or the filing of any English translation, should not be taken as an indication or admission that the art is substantively relevant, but is merely use of a procedural approach to preclude art. <u>Further,</u> at this point, it is respectfully submitted as a reminder that, <u>if new art is now cited against any of Applicant's substantially unamended claims, then it would not be proper to make a next Action final</u>.

INDICATION OF CHANGES MADE

Amendments made herein to the application are shown in the attached "Appendix A-Marked Version" by underlining and brackets to indicate additions and deletions, respectively.

EXAMINER INVITED TO CALL

The Examiner is herein invited to telephone the undersigned attorneys at the local Washington, D.C. area telephone number of 703-312-6600, to discuss an Examiner's Amendment or other suggested actions for accelerating prosecution and moving the present application to allowance.

CONCLUSION

Applicant respectfully submits that, in view of the corrections made to the specification, claims, Abstract and drawings, that the present application is now in condition for allowance, and an early Notice of Allowance to that effect is respectfully requested.

A Petition for a one-month extension of the shortened statutory period for response set by the Office Action mailed 12 September 2002 is filed concurrently herewith, and a Form PTO-2038 is attached. To whatever other extent is actually appropriate and necessary, Applicant petitions for an extension of time under §1.136. Please charge any shortage in any fees due in connection with this application to ATS&K Deposit Account No. 01-2135 (Order No. 501.37892X00).

Respectfully submitted,

Paul J. Skwierawski
Registration No. 32,173
ANTONELLI, TERRY, STOUT & KRAUS, LLP
1300 North Seventeenth Street, Suite 1800
Arlington, Virginia 22209-3801, USA
Telephone 703-312-6600
Facsimile 703-312-6666

ATTACHMENTS:
Appendix A-Marked Version
Clean Copy of Abstract
Copy of Form PTO-1449
Form PTO-2038 (Codes 1201/1251)

CONCURRENT SUBMISSIONS:
Letter to the Official Draftsperson and
        Sixteen (16) Sheets of FORMAL
        Drawings for Figures 1-16
Petition for Extension of Time

APPENDIX A-MARKED VERSION

IN THE SUBSTITUTE SPECIFICATION:

Please delete the paragraph on page 1, lines 6-17, and enter the following replacement paragraph therefor.

The present invention relates to an analyzing unit, an inspecting system and a manufacturing method using the inspecting system, which are applied to a production line used in the manufacture of electronic devices and the like; and, more particularly, the invention [relate] relates to an analyzing unit, an inspecting system and a manufacturing method using the inspecting system, which efficiently classify images obtained as a result of inspection of devices being manufactured, to thereby shorten the analysis time required to detect a failure on the production line and to enable enhancement of manufacturing efficiency and a rapid yield ramp-up.

Please delete the paragraph on page 3, lines 15-27, and enter the following replacement paragraph therefor.

For achieving the aforementioned objects, according to the present invention, there is provided an inspecting system comprising an analyzing unit, said analyzing unit including an image detection device for photographing a plurality of images of a workpiece; a storage means for storing images produced by said image detection device; and a display means having a first area for displaying a plurality of the images that are stored in said memory means and a plurality of second areas for [421assifying] classifying said detected images according to features of said detected images; wherein said plurality of detected images can be moved on a

screen from said first area to corresponding second areas to classify said plurality of detected images in said second areas.

Please delete the paragraph spanning page 11, line 19 through page 12, line 18, and enter the following replacement paragraph therefor.

Next, a defect image 402 which is to be indicative of the characteristic of the classification area 152 is moved from the unclassified image display area 151 to serve as a typical defect image for the classification area 152, as shown in FIG. 7(a) (Step 307). For example, a typical defect image 402 present in the unit classified image display area 151 is clicked by a mouse and moved to the classification area 152 by a drag and drop operation. In this case, in the area category information shown in FIG. 7(b), a moved defect image IMG001 is described in the column of the area coordinates (000160, 000020) (000220,000100), as category "white." Alternatively, it is possible that the actual defect image is not moved from the unclassified image display area 151, but that a schematic image is displayed instead. In this case, a plurality of schematic images as desired are produced in advance, and the thus produced images may be introduced as typical defect images in respective classification areas. Alternatively, also, the typical defect image or images need not be displayed on the respective classification areas, but text information representative of the features may be displayed.

Please delete the paragraph spanning page 12, line 22 through page 13, line 4, and enter the following replacement paragraph therefor.

Similarly, the other classification areas 153, 154, 155 are defined, as shown in FIGS. 9(a) and 9(b), and unclassified defect images which are similar to a particular typical defect [ima4e] image are classified from the unclassified image display area 151 to the classification areas 152, 153, 154, 155, whereby the classification operation with respect to all the defect images is carried out. FIG. 10 is a display screen showing the classification results. While in this case, four different classification areas were provided for the classification operation, it is noted that the contents and the number of the categories may be changed as necessary.

Please delete the paragraph at page 15, lines 7-14, and enter the following replacement paragraph therefor.

Next, the display/analyzing device 203 obtains the detected result shown in FIG. 4 from the storage unit 202 and displays the detected defect image on the unclassified image display area 151 (Step 1201). The processing up to the point where the display/analyzing device 203 displays the detected defect image on the unclassified [imago] image display area 151 is similar to that of the example previously mentioned, and so a repetition of the detailed description is omitted.

Please delete the paragraph at page 15, lines 15-19, and enter the following replacement paragraph therefor.

Next, the automatic classification starts on the [def6ct] defect image displayed on the unclassified image display area 151 (Step 1202)[ ]. That is, a category in which the feature of each defect image falls is calculated on the basis of the function stored in the image detecting device 201 (Step 1203).

23

Please delete the paragraph spanning page 15, line 20 through page 16, line 3, and enter the following replacement paragraph therefor.

When the category is calculated, the defect image is moved to the corresponding classification area on the display screen on the basis of the aforementioned area attribute information (Step 1204)[ ]. FIG. 15 is a view showing a display screen after such movement. With respect to a defect image that cannot be subjected to image processing according to the detected conditions leading to failure to obtain the necessary features, or a defect image which does not fall under any category, the defect image is moved from the unclassified area to a specific classification area manually in the manner described previously using a mouse or a keyboard for effecting the classification operation.

Please delete the paragraph at page 16, lines 4-17, and enter the following replacement paragraph therefor.

In the case where the classification for all the images is completed (Step 1205), the classified result is confirmed (Step 1211), and whether or not the classified result is to be corrected is judged by examination of the screen (Step 1212). The correction of the classified result is shown in FIG. 15. In FIG. 15, in the case where a defect image A is corrected in category by transferring it from a classification area 155 to a classification area 153, for example, the defect image A present in the classification area 155 is clicked by a mouse (Step 1206) and moved to the corresponding classification area 153 by a drag and drop operation, thus enabling easy correction of the classified result (Step 1209). Alternatively, in the

case where no corresponding category is present, a category may be newly added (Step 1208).

Please delete the paragraph spanning page 17, line 16 through page 18, line 2, and enter the following replacement paragraph therefor.

In analyzing the classified results, an applicable classified result is obtained from the storage unit 202 in the display/analyzing device 203. FIG. 16 shows one example of the analyzing screens thereof. Numeral 1601 designates a position of the detected defect image obtained from the classified results shown in FIG. 11, showing a defect distribution on the wafer. Numerals 1602 and 1603 designate the defect images on the wafer, the imaging conditions and the like. Numeral 1604 designates a classification result display area, in which the classified results relative to the applicable defect images are [6ollected] collected on the spot to display the results thereof. For example, the number of occurrences and the rate of occurrence according to the categories are calculated from the classified results shown in FIG. 11 and are displayed.

IN THE CLAIMS:

1.(Twice amended) An inspecting system comprising: an analyzing unit, said analyzing unit including an image detection device for producing a plurality of images of a workpiece; storage means for storing detected images produced by said image detection device; display means having a screen with a first area for displaying a plurality of said detected images stored in said [memory] storage means and a plurality of second areas for classifying said detected images according to

features of said detected images; and means for moving said plurality of detected images on said screen from said first area to selected second areas to classify said [plurality of] detected images in said second areas.

2.(Twice amended) An analyzing unit comprising: storage means for storing a plurality of images; display means having a screen with a first area for displaying images stored in said storage means and a plurality of second areas for classifying said images according to features of said [detected] images; and means for moving ones of said plurality of images on said screen from said first area to selected second areas to classify said plurality of [detected] images in said second areas.

3.(Twice amended) A method of manufacturing an electronic device, wherein use is made of a manufacturing apparatus for processing a workpiece to form an electronic device[;], an inspecting apparatus for inspecting the workpiece processed by said manufacturing apparatus[; and], an analyzing unit including an image detection device which is capable of producing an image of said workpiece, and a storage means for storing images of workpieces detected by said image detection device[;], the method comprising [the steps of]: displaying detected images stored in said storage means on a first area of a screen, the screen having a plurality of second areas for classifying said detected images according to features of said detected images; moving ones of said [plurality of] detected images on said screen from said first area to selected second areas to classify said [plurality of] detected images in said second areas; providing information to said analyzing unit concerning images in said second areas of said screen; and controlling the production line

26

having said manufacturing apparatus arranged thereon using information obtained

from said analyzing unit. [to process the workpiece.]

Please enter new Claims 4-11, as follows.

4.(New) An inspecting system comprising: an analyzing unit, said analyzing

unit including an image detection device to produce images of semiconductor

manufacturing defects for a workpiece; a display with a sorting display area in which

to display ones of said images with unclassified semiconductor manufacturing

defects, and a plurality of defect-classification display areas into which each image

of said images may be classified according to visual manufacturing defect features

contained in the image; and a user-manipulated moving unit to move a subject

image from said sorting display area to a selected one of said defect-classification

display areas, to classify said subject image into the selected one of said defect-

classification display areas.

5.(New) An inspecting system as claimed in claim 4, wherein the user-

manipulated moving unit includes a user-manipulated pointing device to point to,

select and drag-and-drop said subject image from said sorting display area into the

selected one of said defect-classification display areas.

6.(New) An inspecting system as claimed in claim 5, wherein said user-

manipulated pointing device is a mouse.

7.(New) An inspecting system as claimed in claim 4, comprising a memory to store predetermined information for at least ones of said images including defect-classification information, and an adjuster unit to adjust said defect-classification information for said subject image to match a defect classification of the selected one of said defect-classification display areas to which said subject image is moved.

8.(New) An inspecting method, comprising: using an image detection device to produce images of semiconductor manufacturing defects for a workpiece; displaying images of unclassified semiconductor manufacturing defects within a sorting display area of a display, and displaying a plurality of defect-classification display areas into which each image of said images may be classified according to visual manufacturing defect features contained in the image; and user-manipulated moving of a subject image from said sorting display area to a selected one of said defect-classification display areas, to classify said subject image into the selected one of said defect-classification display areas.

9.(New) An inspecting method as claimed in claim 8, wherein said user-manipulated moving is effected with a user-manipulated pointing device to point to, select and drag-and-drop said subject image from said sorting display area into the selected one of said defect-classification display areas.

10.(New) An inspecting method as claimed in claim 9, wherein said user-manipulated pointing device is a mouse.

11.(New) An inspecting method as claimed in claim 8, comprising storing

predetermined information for at least ones of said images including defect-

classification information in a memory, and adjusting said defect-classification

information for said subject image to match a defect classification of the selected

one of said defect-classification display areas to which said subject image is moved.

IN THE ABSTRACT:

Please enter the following replacement Abstract.

The present invention has an analyzing unit including an image detection

device for producing a plurality of images of a workpiece, a storage for storing

detected images produced by [said] the image detection device, and a display

having a screen with a first area for displaying a plurality of detected images stored

in the storage and a plurality of second areas for classifying the detected images

according to features of the detected images, whereby [said] the plurality of detected

images are moved on the screen from the first area to selected second areas to

classify the plurality of detected images in the second areas.